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HN504™ ACTIVATOR

Introduction

HN504™ is a specially formulated tin/palladium colloidal catalyst that can render non-conductive surfaces conductive. The HN504™ Activator Bath is packaged as a two-component system. HN503 Pre-Dip is the aqueous carrier solution and HN504.2™ Acid-Free Activator is the metal-containing liquid concentrate. When mixed together, they form the operating HN504™ Activator bath. **ALWAYS** use **FRESH** HN503™ Pre-Dip to mix the HN504™ Activator bath or to make additions to the bath.

Operating Conditions

CONCENTRATION

HN503™ 95% v/v

HN504.2™ 4.5-5.5% v/v
5.0% optimum

TEMPERATURE

102~110°F
104°F optimum

DWELL TIME

5 - 10 minutes (10 minutes preferred)

RINSE TIMES

Dual cascading counterflow rinse – 30 seconds per station

Make Up and Operating Procedures

1. Fill freshly cleaned and dried tank about 90% full with HN503™ Pre-Dip. Warm the HN503 to 104-110°F. Use a water jacket around the tank or a hot water heat exchanger in the tank. By heating the water in the water jacket or by circulating warm (less than 130°F) water through the coils of the heat exchanger, warm the HN504™ Activator solution to 104-110°F. Do NOT use ordinary direct contact immersion heaters in the HN504™ bath. Special low watt density heaters can be used (check with STS for specifications). Do NOT use steam or water heated over 130°F in the heat exchanger. Do NOT inject steam directly into the HN504™ bath.
2. Add 5 gallons HN504.2™ Acid-Free Activator for each 100 gallons of finished HN504™ Activator solution desired. Stir to disperse the HN504.2™. Add more HN503™ Pre-Dip to bring bath to operating level and mix well.
3. Using parts freshly processed through HN503™ Pre-Dip, immerse parts into the HN504™ bath for 5~10 minutes. Agitate parts horizontally so that HN504™ solution is forced through the holes and into blind vias. A rack agitator with a 2-4 inch stroke operating at 12-15 strokes per minute is satisfactory.
4. After soaking for 5~10 minutes, remove parts from the HN504™ bath, allowing excess solution to drain back into the tank. Rinse parts immediately by dipping into a dual cascade counterflow street water rinse at ambient temperature. **Do not use deionized or RO water for**

rinsing. Soak parts in each rinse station for 30 seconds. Remove parts from rinse tanks and proceed immediately to HN505™ Accelerator.

NOTES: During the process cycle, **DO NOT** remove parts from HN504™ solution before the 10-minute cycle is complete. If parts are inadvertently removed from the HN504™ bath before the desired cycle is complete, rinse parts well and rework through the process starting with the HN503™ Pre-Dip.

HN503™ Pre-Dip is saturated with inorganic salts. Crystals are usually present in the bottom of the containers. When transferring HN503™ from the containers, agitate the solution to suspend the crystals. **DO NOT** use water to rinse crystals out of containers into the HN504™ tank. It is okay to have extra crystals left in the container.

Control Data

Shop Level Control

Check temperature of the HN504™ bath at least once every shift. Adjust temperature of the water in the water jacket or feed water to the heat exchanger so that the HN504™ bath temperature remains 104-110°F. Never let the water in the water jacket or heat exchanger exceed 130°F. Never let the HN504™ bath exceed 120°F.

Salt crystals will form over time and settle to the bottom of the tank. Daily removal of the crystals with a long-handled scoop is recommended to keep the build up of crystals to a minimum.

Replace dragout losses with a fresh mixture of 95% by volume HN503™ Pre-Dip and 5% by volume HN504.2™.

Never add fresh tap water or deionized or distilled water to the HN504™ bath.

For maintaining fluid level, additions to the HN504™ bath **MUST** be made with **FRESH** HN503™ Pre-Dip or mixtures of HN504.2™ Acid-Free Activator with HN503™ Pre-Dip. HN504.2™ will be added by itself to compensate for palladium use.

Immersing parts processed in HN504™ into the rinse tank causes the rinse water to immediately become cloudy. Adequate water flow into the counterflow rinse tanks must be provided to keep the second tank free from cloudiness. The water flow should also be adequate to clear most of the cloudiness from the first rinse tank before the next basket of parts processed in HN504™ is ready to be rinsed. **DO NOT RINSE IN HOT DI WATER.**

Replenishment

Replace dragout and evaporation losses with fresh HN503™ Pre-Dip.

Bath Recharging Cycle

HN504™ baths that are properly protected by changing the preceding HN503™ Pre-Dip bath at the specified frequency rarely, if ever, need to be discarded. Periodic analysis and addition of HN504.2™ Acid Free Activator to replace tin/palladium use will keep the bath in balance. Due to eventual drag in of contaminants and a gradual build up of copper and Tin IV, the Activator bath should be replaced when 5,000 surface square feet per gallon of tank capacity have been processed, or once each 12~15 months. More frequent replacement may be required if the preceding rinses are insufficient or if the bath becomes contaminated. Baths heated with low watt density direct immersion heaters (see below) may require more frequent changing. Additions of HN504.2™ concentrate will maintain strength.

The information and recommendations of Solution Technology Systems / Florida Cirtech concerning this product are based on laboratory tests and experience and to the best of our knowledge and belief are true and accurate. Since conditions of actual use are varied and beyond our control, any recommendations or suggestions are made without warranty expressed or implied.

Equipment

Tanks fitted with water jackets or heat exchangers to provide indirect heat are recommended for the HN504™ bath. Ordinary, direct contact immersion heaters are NOT acceptable; however, special Teflon low watt density (6 watts / square inch rating) immersion heaters may be used. Heat exchangers should be heated with water no hotter than 130°F. Do not inject steam or hot water directly into HN504™ solutions. Tanks made of polypropylene, PVC, or CPVC are acceptable. Heat exchangers made of Teflon or polypropylene are recommended for HN504™ baths heated with warm water.

Mechanical agitation using a polypropylene covered mixing shaft is recommended for circulation. Circulation pumps are not recommended for this bath as they tend to clog with salt crystals and suck air into the bath. Mixing motors should not be so large as to cause cavitation in the bath.

Tanks fitted with lids designed to float on the activator surface will minimize evaporation while prohibiting drips of condensed water vapor into the activator bath.

Handling and Safety

HN503™ Pre-Dip and HN504.2™ Acid-Free Activator may be irritating to skin and eyes. Protective clothing such as impervious gloves, aprons, boots and chemical goggles should be worn when handling these materials. In case of accidental contact, flush immediately with water. Remove contaminated clothing and wash before wearing again. For eye contact, flush with fresh water for 15 minutes and seek medical attention at once. HN503 and HN504.2™ may be harmful if swallowed or inhaled. Avoid breathing vapors or mists. **READ MSDS!**